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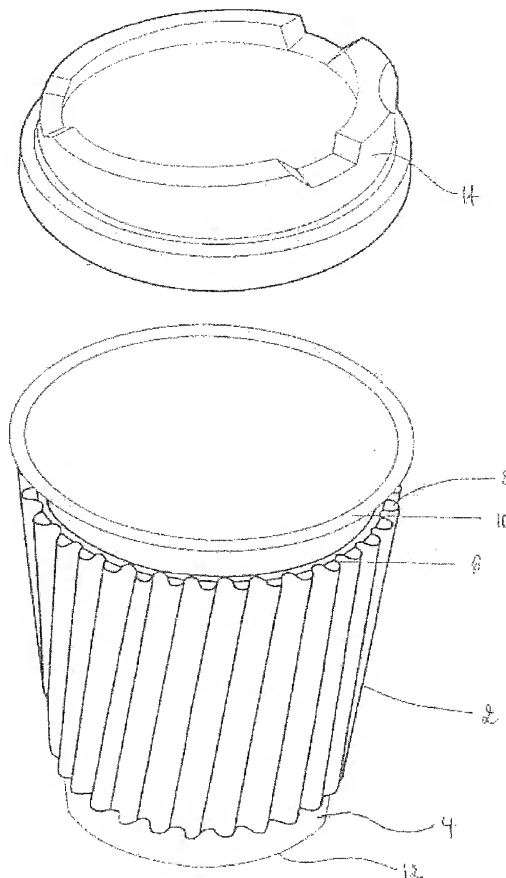
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(54) **Heat Barrier Paper Cup**

(57) A cup having a liquid retaining wall (4), on the outer surface of which is adhered a backing layer (6) and a corrugated layer (8) of suitable material.

Figure 1.



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## Description

### Field of the Invention

[0001] This invention relates to a cup having a liquid retaining wall, on the outer surface of which is adhered a backing layer and a corrugated layer of suitable material.

### Background of the Invention

[0002] Disposable cups are widely used for holding coffee, soup or other hot beverages or products for takeout ordering. Such cups may alternatively be used to hold cold beverages. The use of such cups, normally of standardised sizes, is extremely convenient and relatively inexpensive. Disposable cups are normally generally frusto-conical in shape and usually have a top rim that is adapted to receive one of several standard sizes of plastic lid.

[0003] These cups are normally made from paper or polystyrene. Although polystyrene is a good thermal insulator, it has the disadvantage that it is not easy to recycle and is not biodegradable. In contrast, paper has the advantage that it is both easily recyclable and biodegradable. However, one of the disadvantages of using paper is that it is a poor insulator. As a result, the thin walls of paper cups make them difficult to handle when filled with a hot or cold beverage, due to the elevated or reduced temperature of the contents of the paper cup. In an attempt to overcome this problem, many vendors of drinks place the paper cup inside another cup. However, such double capping is very wasteful and uses up a large amount of resources. In addition, increasing the single wall paper cup to a double or triple layer will only postpone the transfer of heat energy from the cup to the hands of the user. Thus, the high temperature of the beverage will still make the cup too hot for the user to carry comfortably.

[0004] Attempts have been made to provide insulation for the comfortable handling of a paper cup, by the provision of an insulating holder for holding the cup. Such holders are generally made from paper and are configured to be in close contact with the cup and to protect the user's hands from uncomfortably high or low temperatures. Such holders are typically disposable and have the advantage that they represent a significantly smaller burden on the environment than the provision of an additional cup.

[0005] One such insulating holder is disclosed in US Patent No. 5,425,497, wherein the holder is made from an elongate band having a plurality of discrete, hemispherically-shaped depressions that cover the surface of the band, thus forming a plurality of air insulating gaps between the band and a cup around which the band is placed. The ends of the band interlock such that the holder is held in position. Another such holder is disclosed in US Patent No. 5,842,633, wherein the holder is provided

by an elongated band of flexible corrugated material which is fixed in position around a cup by the interaction of interlocking ends. One of the disadvantages associated with such holders is that they require assembly prior to use.

[0006] Other configurations of holders have been devised that require minimal assembly. For example, US Patent No. 5,454,484 discloses an insulating holder which is made from a folded paper band whose ends have been fixed together. The folded band expands to form an oval shape by squeezing the edges of the folded holder, therefore providing an opening to receive the bottom end of a cup. The use of such a holder has become the standard in the field. In addition, US Patent Application No. 2005/0056654 A1 provides an insulating cup that is preassembled to allow its immediate use.

[0007] However, the provision of a separate holder generally requires additional time for assembly when serving a customer and thus may be inconvenient to the user. In addition, the holder may not be effective where the contents of a cup are very hot, for example, when milk has not been added to coffee and the water is close to boiling point. In such cases, two holders may be required.

[0008] The aim of the present invention is to provide a cup that overcomes these problems and provides greater thermal insulation, such that the cup may be comfortably held by the user.

### Summary of the Invention

[0009] According to a first aspect, the present invention provides a cup having a liquid retaining wall, on the outer surface of which is adhered a backing layer and a corrugated layer of suitable material.

[0010] In a preferred embodiment, a cup in accordance with the present invention has a rim defining an open top, and a closed base. The liquid retaining side wall is generally cylindrical and preferably the cup is tapered such that it is narrower at the bottom and wider at the top. This allows cups to be stacked one inside another. A cup in accordance with the present invention may be one of several standard sizes which are known in the trade.

[0011] In one embodiment, a cup in accordance with the present invention comprises a top rim which is adapted to engage with a lid to improve thermal insulation. Typically, the lid is made from plastic. Alternatively, the lid may be made from polystyrene or paper.

[0012] Preferably, the cup, backing layer and corrugated layer of a cup in accordance with present invention are made from paper. Conveniently, a cup in accordance with the present invention, is inexpensive and disposable.

[0013] In a preferred embodiment, the corrugated layer is joined to one surface of the backing layer and the backing layer is joined to the outermost surface of the liquid retaining side wall. Preferably, the backing layer and corrugated layer cover substantially the entire outer

surface of the liquid retaining side wall of the cup. In another embodiment, the backing layer and corrugated layer may be shorter in height than the side wall and attached to Portion thereof.

**[0014]** The corrugations in the corrugated layer reduce the surface contact between the corrugated layer and the backing layer, thus forming air pockets between the corrugated layer and the backing layer. The pockets of air provide improved insulation to assist in maintaining the temperature of the contents of the cup.

**[0015]** In addition, the corrugations reduce the thermal conductivity between the hand of the user and the outermost surface of the cup, such that the amount of conductive heat transfer is reduced. The corrugated surface of the cup additionally provides a surface texture which improves the grip of the user holding the cup.

**[0016]** Preferably, the corrugations are arranged at regular intervals over the surface of the cup. More preferably, the corrugations are closely packed with little or no gap between adjacent corrugations. Typically, the corrugations are parallel to one another,

**[0017]** In one embodiment, the outer surface of the corrugated layer displays advertising or other material. In another embodiment, the outer surface of the corrugated layer is laminated.

**[0018]** A cup in accordance with the present invention has the advantage that it prevents the requirement for the provision of an additional holder, thus facilitating efficient use of storage and shipping space. In addition, a cup in accordance with the present invention avoids the need to assemble an additional holder, thus minimising time and effort for both the vendor and consumer.

**[0019]** In accordance with a second aspect, the present invention provides a method of producing a cup having a liquid retaining wall, wherein the method includes the step of adhering a backing layer and a corrugated layer to the outer surface of a cup. Preferably, the corrugated layer is joined to one surface of the backing layer and the other surface of the backing layer is joined to the outermost surface of the liquid retaining wall.

### Detailed Description of the Invention

**[0020]** The invention will be further described by way of illustrative example, with reference to the following figures wherein:

Figure 1 is a perspective view of a cup in accordance with the first aspect of the present invention:

Figure 2 is a transverse cross sectional view of a cup in accordance with the first aspect of the present invention; and

Figure 3 is an angled view of a cup in accordance with the first aspect of the present invention, with the corrugated layer and backing layer partially removed from the liquid retaining wall of the cup.

**[0021]** With reference to Figure 1, a paper cup (2) is shown having a liquid retaining wall (4), on the outer surface of which is adhered a backing layer (6) and a corrugated layer (8), both of which are, made from paper. The cup (2) has a top rim (10) and a closed base (12). The top rim (10) is adapted to engage with a plastic lid (14). The cup (2) is tapered such that it is narrower at the bottom and wider at the top.

**[0022]** The backing layer (6) and corrugated layer (8) have essentially similar dimensions, and are both formed from an elongate band of paper. In each case, the band of paper has a length that is defined between a first end and a second end, and a width defined between top and bottom edges.

**[0023]** The corrugations in the corrugated layer reduce the surface contact between, the corrugated layer and the backing layer, thus forming air pockets between the corrugated layer and the backing layer. In addition, the surface contact between the corrugated layer and the hand of the user is reduced. This has the advantage of improving thermal insulation of the cup, and reducing conductive heat transfer from the cup to the hand of the user.

**[0024]** While one embodiment of the present invention has been described in detail above and illustrated in the accompanying drawings, it will be evident to those skilled in the art that changes and modifications can be made without departing from the essence of the invention.

### Claims

1. A cup having a liquid retaining wall, on the outer surface of which is adhered a backing layer and a corrugated layer of suitable material.
2. A cup in accordance with claim 1 having, a rim defining an open top, and a closed base.
3. A cup in accordance with claim 1 or 2 wherein the liquid retaining wall is generally cylindrical.
4. A cup in accordance with any one of the preceding claims wherein the cup is tapered such that it is narrower at the bottom and wider at the top.
5. A cup in accordance with any one of claims 2 to 4, wherein the rim is adapted to engage with a lid to improve thermal insulation.
6. A lidded cup in accordance with claim 5, wherein the lid is made from plastic, polystyrene or paper.
7. A cup in accordance with any one of the preceding claims wherein the cup, backing layer and corrugated layer are made from paper.
8. A cup in accordance with any one of the preceding

claims wherein the corrugated layer is joined to one surface of the backing layer and the backing layer is joined to the outermost surface of the liquid retaining wall.

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9. A cup in accordance with claim 8 wherein the backing layer and corrugated layer cover substantially the entire outer surface of the liquid retaining wall of the cup.

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10. A cup in accordance with claim 8 wherein the backing layer and corrugated layer are shorter in height than the liquid retaining wall of the cup.

11. A cup in accordance with any one of the preceding claims wherein the corrugations are arranged at regular intervals over the surface of the corrugated layer.

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12. A cup in accordance with any one of the preceding claims wherein the corrugations are closely packed with little or no gap between adjacent corrugations.

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13. A cup in accordance with any one of the preceding claims wherein the corrugations are parallel to one another.

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14. A cup in accordance with any one of the preceding claims wherein the outer surface of the corrugated layer displays advertising or other material.

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15. A cup in accordance with any one of the preceding claims wherein the outer surface of the corrugated layer is laminated.

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16. A method of producing a cup, wherein the method includes the step of adhering a backing layer and a corrugated layer to the outer surface of a cup.

17. A method in accordance with claim 16 wherein the corrugated layer is joined to one surface of the backing layer and the other surface of the backing layer is joined to the outermost surface of the liquid retaining wall.

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18. A method according to claim 16 or 17, performance of which results in a cup in accordance with any one of claims 1-15.

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Figure 1.

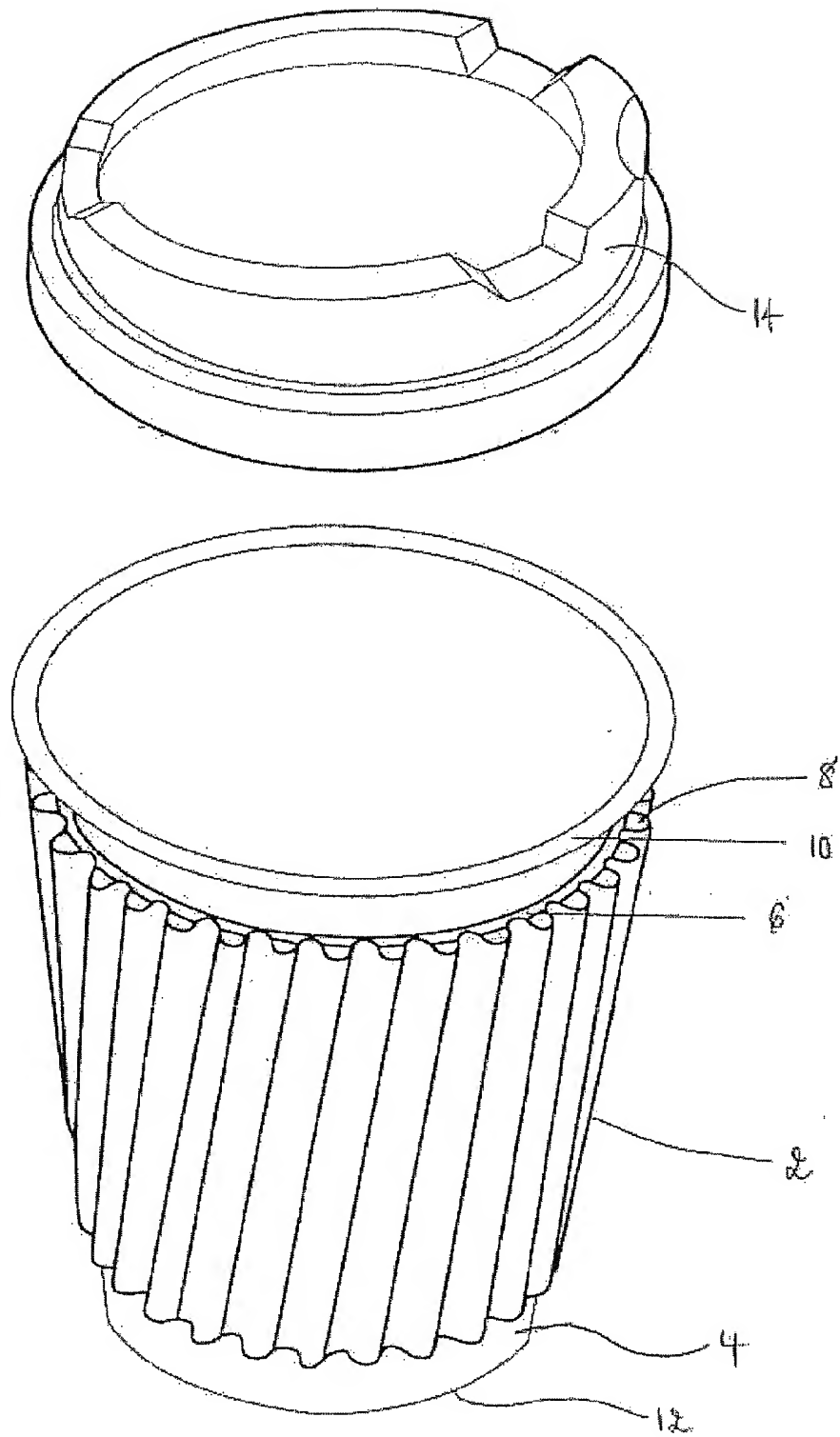


Figure 2

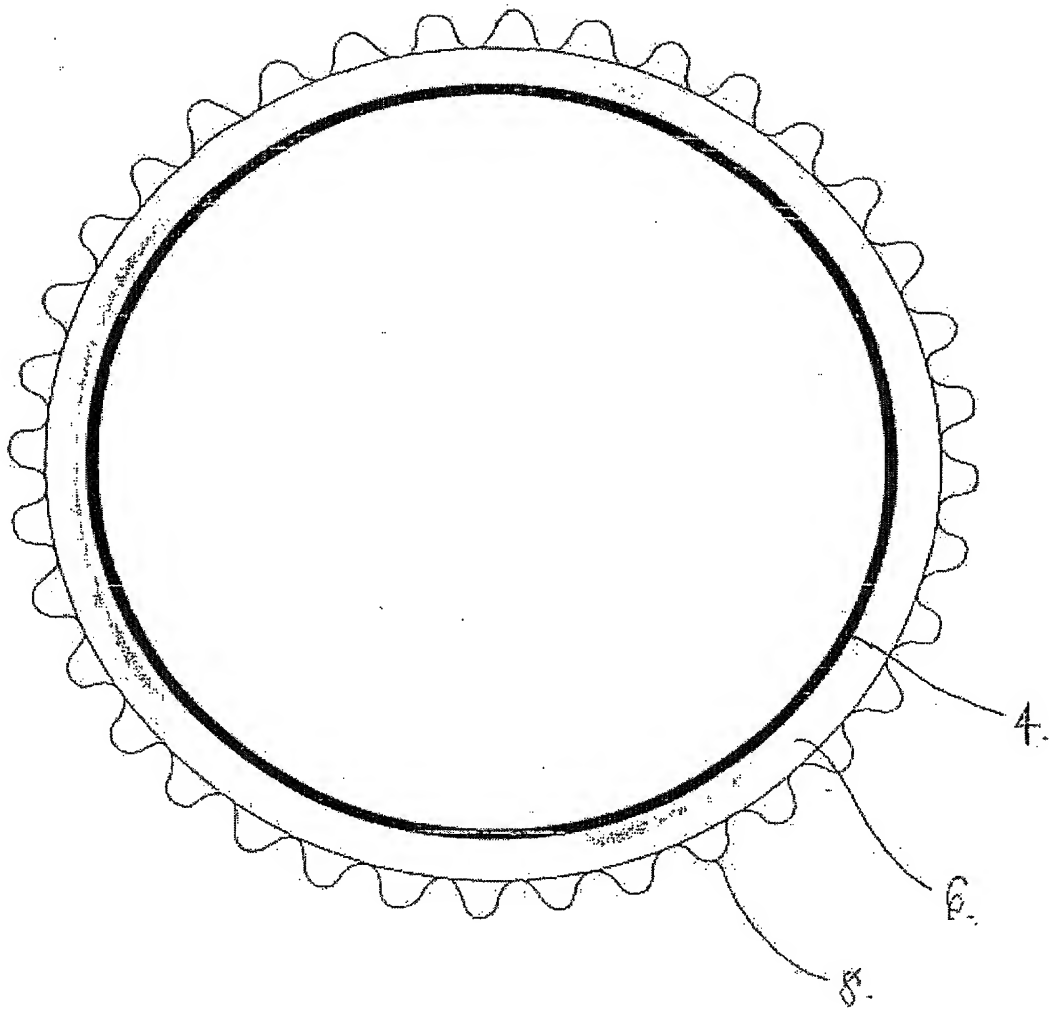
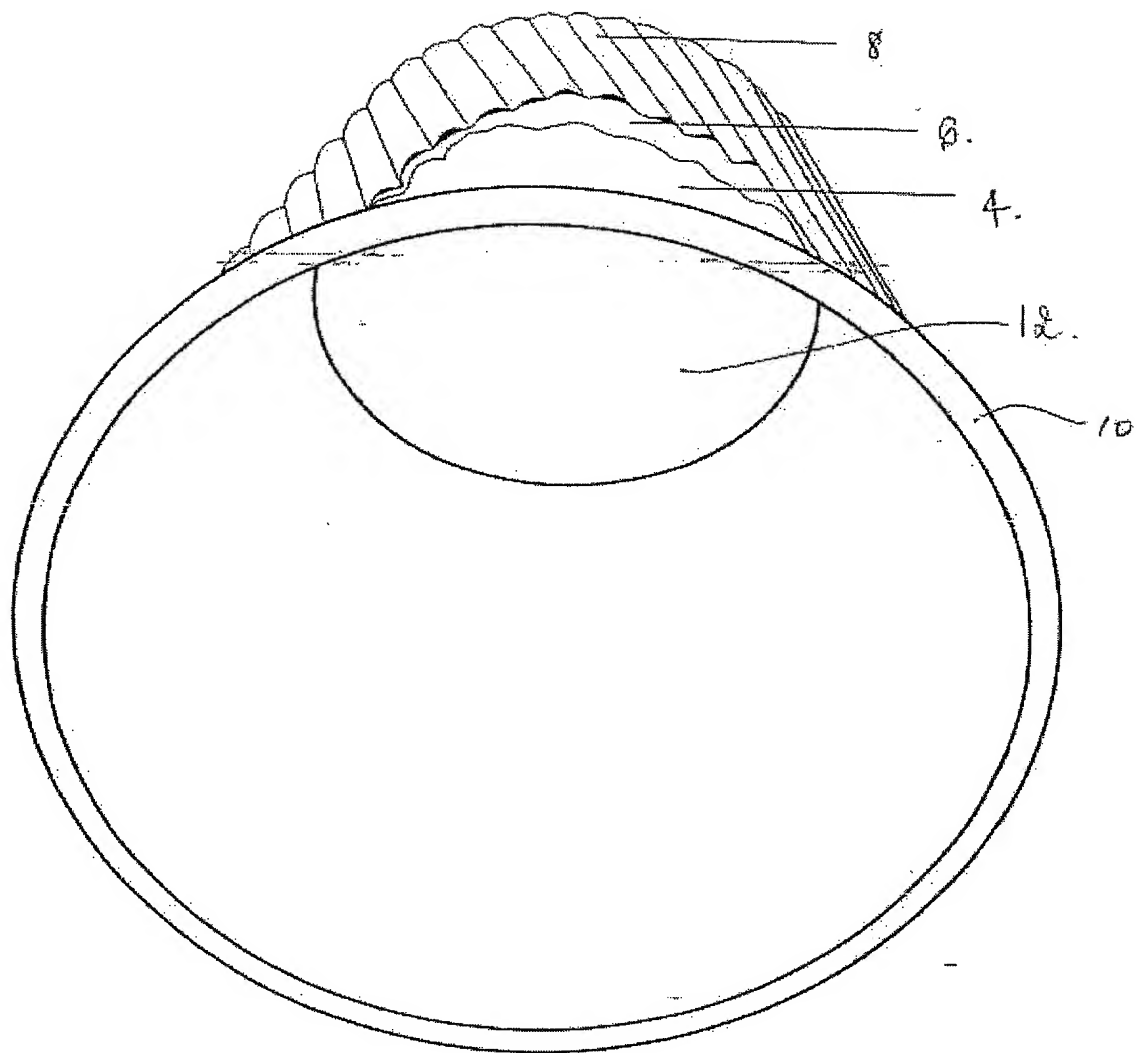


Figure 3.





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# EUROPEAN SEARCH REPORT

Application Number  
EP 06 27 0042

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 908 523 A (SHIKAYA ET AL) 30 September 1975 (1975-09-30)  * column 2, line 10 - line 16 * * column 2, line 25 - line 35 *	1-5, 7-13, 15-18	INV. B65D81/38 B65D3/22 B65D65/40
Y	* column 3, line 57 - column 4, line 9; figures 1,8,9 *	6	
X	US 5 794 843 A (SANCHEZ ET AL) 18 August 1998 (1998-08-18)  * column 2, line 33 - line 48; figures 1,2 *	1-3,5,7, 8,10-14, 16-18	
Y	US 5 772 111 A (KIRSCH ET AL) 30 June 1998 (1998-06-30) * column 9, line 13 - line 18 *	6	
			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 August 2006	Examiner Bridault, A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03/02 (P04C01)



**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 06 27 0042

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